

## Heat exchange device

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Mixer sections (1-4) are inserted into the flow channel. Four intersecting plates (7, 8) and 8 shortened intersecting plates (9-12) (see diagram) are included. The ratio of maximum plate width (x) to pipe diameter (D) is 0.25. The ratio of section length (L) to pipe diameter (D) is 0.8-1.2. Plates include an angle of 42 degrees -48 degrees with the axis. The ratio of perpendicular plate separation (y) to pipe diameter (D) is 0.2-0.4. Mixer plate inserts include elliptical openings, into which the tubes (5, 6) are slid and fastened, as a tube bundle.

Preferred features: Inserts are arranged in succession in the flow channel. Adjacent inserts (1-4) are rotated through 90 degrees with respect to the tube axis. Spacings are related to length (L), with successive rotations of 90 degrees. The mixing inserts comprise up to 8 plates intersecting at most with 16 shortened intersecting plates. Ratios of perpendicular plate width (x) to tube diameter (D) are correspondingly matched. Tubes of the bundle (15) can be freely positioned. The mixer units are brazed to the tube bundle.